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Current Situation on the Excess Mortality of COVID-19 for Various Countries

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Abstract

For the research of COVID-19, the excess mortality has been adequate indicator for comparison of various situation from international point of view. The data of excess mortality in many countries were reported in Jan and April 2021. In current results for annual statistic, excess mortalities are US 458,000, Italy 89,100, England 85,400, Spain 84,100, Poland 60,100, and New Zealand 2500. Previous data showed Taiwan -4800, Australia -4700, and Japan -15000. For COVID-19 pandemic, previous data of excess deaths from public report shows the possibility of underestimation. Several factors are presumably involved in COVID-19 impact including public health measures and influenza prevalence.

Keywords: COVID-19; Excess Mortality; Health and Human Services (HHS); New Zealand; Japan

Commentary

Concerning COVID-19, several projects were found for predicting death rate, such as calculation of age-related relative risk (RR) [1] and fatality rates [2]. The excess mortality has been adequate indicator for the research of COVID-19. The international data from 77 countries were previously summarized and reported, in which some representative data as US 420,000, Brazil 170,000, England 80,000, Italy 64,000, Germany 30,000, New Zealand -2,100, Taiwan -4,800 and Japan -15,000 [3]. The author reported detail situation of Japan with minus excess mortality from several points of view as well as future perspectives for human resources and life [4]. The estimation of excess mortality is based on the additive hazard model, which separates observed mortality hazard into expected mortality and excess period. For example, the result from analysis in UK showed that absolute excess risk was 703 per 100,000 person-years (95% Cl 687-719) for about one third of a year. In 2018, excess risk was 902 for one year. Thus, the risk of 1/3 year in 2020 equals to that of 3/4 year [5]. Most recent data of excess mortality were summarized for 29 high income countries [6]. Highest countries are US, Italy, UK, Spain and Poland, while New Zealand showed lower result. Overall men showed much higher than women. Both results of Jan and April 2020 are compared (Table 1) [3,4,6]. In this article, several current reports are introduced.

For COVID-19 pandemic, previous data of excess deaths from public report seemed to be underestimated. Then detail analysis was conducted by using the Joinpoint regression program [7]. Deaths in US was 1,336,561 during Mar-Aug 1, 2020, which was 20% more than expected. Out of 225,530 excess deaths, 150,541 cases (67%) seemed to be attributed to COVID-19. In recent report, excess deaths were 2,801,439 during Mar-Dec 2000, which showed 22.9% increase than expected with 522,368 excess deaths [8]. Among them, three subgroups were analyzed, where non-Hispanic Black, non-Hispanic White, Hispanic population showed 208.4, 157.0, 139.8 deaths per 100,000, respectively. Further, the excess death ratio was 16.9%, 61.1%, 16.7%, respectively. COVID-19 has brought remarkable increase in all-cause deaths in the US, which are mostly elder adults. In contrast, adults from 25-44 years were investigated [9]. The methods applied the data from Health and Human Services (HHS) in US. The results showed that all-cause deaths were 76,088 for Mar-July 2020 that was 11,899 more than expected 64,189 deaths (incident rate ratio 1.19). Covid-19 deaths were 4,535, which was 38% of measured excess mortality. For HHS region including New York and new Jersey showed incident rate was 2.30. Age-specific mortality rate was compared between US and European countries. As a result, adverse mortality situations in the US showed 400,700 excess in 2017 [10].

Several studies are from European countries. Excess mortality for care home resident in UK was evaluated from Jan 2017 to Aug 2020 [11]. The results showed that all care home was 6.5%, nursing home was 8.4% and residential home was 4.6% out of 29,542 excess deaths. Among them, 64.7% of excess deaths were suspected or confirmed by COVID-19. Odds ratio for experiencing COVID-19 was 1.8 for nursing services, 5.5 for older people and/or with dementia. From Italy, relationship between care home facilities and excess deaths was conducted [12]. As a result, significant higher excess death was found for the presence of care homes in the municipality. Especially, this situation seems to be driven from elderly people of 70 years and older. The influence of

COVID-19 was studied for 31 nursing homes (NH) in Italy [13]. Totally 3,946 NH residents showed females 73.9% and 87 years in median were included. Among them 1,136 was positive for COVID-19. As a result, the risk of death was increased as HR 1.85 by COVID-19.

Table 1: *Excess mortality metrics for the countries in the dataset.*

Country	Estimated number of excess deaths in 2020	
	Islam ref.6	Karlinsky ref.3
	April 29,2021	Jan 27,2021
United States	458000	420000
Italy	89100	64000
England & Wales	85400	80000
Spain	84100	78000
Poland	60100	67000
France	43500	52000
Germany	25900	30000
Belgium	17900	18000
Hungary	16600	11000
Netherlands	15300	18000
Czecho Republic	14400	
Sweden	9300	9400
Portugal	8500	12000
Greece	7700	4700
Austria	6800	8600
Scotland	6800	
Switzerland	6800	6400
Lithuania	6800	6400
Slovakia	4400	2500
South Korea	4000	-2500
Slovenia	3200	2800
Nothern Ireland	2200	
Finland	1000	890
Latvia	820	1700
Estonia	670	620
Norway	-70	-20
Denmark	-160	650
New Zealand	-2500	-2100
Mexico		270000
Russia		270000
Brazil		170000
South Africa		96000
Peru		93000
Australia		-4700
Taiwan		-4800
Japan		-15000

Israel is known to conduct early vaccination. Excess all-cause mortality rates were studied for Mar-Nov 2020 compared with 2017-2019 [14]. Total mortality rate was significantly 6% higher, where 11%, 13%, 19% higher in Aug, Sept, and Oct, 2020. Excess mortality was significantly 7% higher in 65-74/75-84 years, and 8% higher in 85≤ years, and greater for males than females in all ages.

Ecological analysis was performed for 22 countries compared with 5-year historical all-cause mortality. There were excess deaths of 716,616 compared to last 5 years, where 64.3% of them were

attributed to COVID-19. Consequently, deaths data would be underestimated by at least 35% by COVID-19 [15]. Excess mortality data show minus number in New Zealand, Taiwan and Japan. New Zealand conducted strict intervention of public health during middle March for 12th week of 2020, such as early border closure, compulsory self-isolation after travelling, nationwide lockdown, limited contacts and isolation of infected cases [16]. In combination with the geographical isolation, these effective interventions brought COIVD-19 elimination in early June, 2020 for 24th week [17]. Furthermore, persistent reduced mortality would be also from the absence of influenza epidemic in 2020. Consequently, both of public health measures and influenza prevalence were presumably involved in COVID-19 elimination [18]. In Taiwan, COVID-19 affected confirmed 911 cases, and 8 death until Jan 31, 2021 [19]. For statistic method, spline-smoothed Poisson regression models were used for death rate and seasonal effect from Jan 2015- Dec 2019. Then, expected deaths were calculated for Jan 2020 to Jan 2021, and excess deaths were estimated for -2,433 (95% CI: −10,715 to 5,850) [20]. This method also enables the analysis of various cause of reduction in mortality from pneumonia and influenza [21].

For Japan, healthcare access during COVID-19 impact was investigated for actual medical practice [22]. As a result, limited accessibility was found and future proposal for urgent supportive management against prolonged pandemics will be proposed. In summary, currently meaningful reports were described and discussed. The information will become hopefully useful for further research development. Conflict of interest: The author declares no conflict of interest.

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